

Remarks/Arguments:

The claims have been extensively amended in response to the Office Action.

Firstly, the claims are amended to overcome the rejection under 35 USC 112. Claims 1 and 5 are amended to remove the language cited as objectionable by the Examiner. Claim 9 is cancelled. Withdrawal of the rejection is urged.

Secondly, the claims are amended to further define the invention and thereby expedite prosecution of this Application. Claim 1, the sole independent claim in this Application, is amended to further define the composition as including a cured epoxy resin material (support: page 13, line 5) having a dielectric loss factor of from about 0.005 to about 0.028 (support: page 15, line 11) with the claimed particulate filler including particles ranging from about thirty percent by volume to about forty-five percent by volume of said dielectric composition (support: Table, bottom page 14), these particles having a particle size from about five to about thirty-two microns (support: Table, bottom page 14). Claim 1 includes the original limitations, including particularly that the resulting dielectric layer formed from same does not include continuous or semi-continuous fibers as part thereof.

Dependent claim 2 is amended to define the formed substantially solid layer as including a pattern of holes therein having a density of from about 5,000 to about 10,000 holes per square inch (support: page 15, last paragraph).

Dependent claims 3-5 are amended to amend dependencies and assure proper antecedent bases for the language therein.

Dependent claims 7 and 8 remain as originally filed, as are claims 17 and 19.

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Dependent claim 12 remains as previously submitted, while claims 13, 14 and 16 are amended for antecedent purposes.

All other claims are cancelled.

The above amending, including that urged by the Examiner, is fully supported and does not, therefore, represent the introduction of new matter. Entry is urged.

As stated extensively in Applicants' background, it is typical in the prior art for PCB manufacturers, when using *epoxy* resin materials for their dielectric layers to also provide some form of reinforcement, usually in the form of fibers (e.g., fiberglass strands) or mat material. Applicants have taught herein the combination of using such epoxy resins and, more specifically, a resulting dielectric layer having same there but one which specifically excludes continuous or semi-continuous fibers. The result is a layer which functions as an effective dielectric for PCB's and chip carriers, but which is able to assure the high densities of holes (e.g., plated thru holes) often required in today's substrates. It is able to do so while assuring an acceptable dielectric loss factor (0.005 to about 0.028) and with particles of acceptable (workable) size (5 to 32 microns). Finally, these claimed particles are able to form about 30 to 45 percent by volume of the final layer. This claimed composition is thus one which is able to provide many highly desired properties while enabling use thereof in the complex and demanding environment of miniaturization.

Mao, the primary patent cited against the claims, has been carefully reviewed. Mao does not teach exclusion of fibers; in fact, this patent does not mention same. Nor does this patent teach an *epoxy* resin, instead requiring a "toughened" benzocyclobutene resin. Mao also fails to specifically teach particle sizes in the range which Applicants now claim (5 to 32 microns). Mao's particles are "less than or equal to ten percent of the layer thickness of the dielectric material" (col. 4, lines 41-44) with a resulting layer thickness of "25 microns or less" but which may also be as thick as 36 microns or even 40 microns (col. 5, lines 56-58). While Mao does

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mention thicknesses of the dielectric as high as 100 microns, his following language in col. 5 clearly limits his teachings to only as thick as the mentioned 40 microns. Such limitation is further supported by the fact that Mao only claims a thickness of less than 40 microns (claim 2) following an originally submitted claim (original claim 7, now cancelled) which limited the thickness to 50 microns. A fair reading of Mao thus provides the person of ordinary skill in the art only one conclusion: Mao limits his acceptable maximum particle sizes to about 4 microns, and definitely no greater than 5 microns. As such, his particle sizes are less than those possible using the teachings of the now claimed invention. Still further, and equally significant, Mao requires a loss factor of less than 0.004. In sharp comparison, Applicants' claimed layer possesses a loss factor of from about 0.005 to about 0.028, greater than the 0.004 of Mao. Finally, Mao is absent any claim to volume percentages for his particles, instead requiring 0.50 to 75 percent by weight. Applicants claim instead a volume percentage of the particles at 30 to 45 percent.

In summary, Mao fails to teach and is entirely non-suggestive of the invention of claim 1 and is thus unable to teach or suggest a dielectric layer having the many attributes now claimed therein. The rejection of claim 1 under **35 USC 102** is thus overcome and withdrawal thereof respectfully urged. Because the remaining dependent claims depend from claim 1, directly or indirectly, the rejection under **35 USC 102** of said claims is also overcome.

The remaining dependent claims in this Application, dependent directly or indirectly on claim 1 as mentioned, and thus on subject matter which is clearly patentable over the art of record herein, are also patentably distinguishable over the additional documents cited herein and allowance thereof also respectfully requested. Specifically, neither Salensky nor Papathomas suggest compositions or layers having the now claimed properties of claim 1 in combination with those of the dependent claims 17 and 19. Taking the teachings of these documents in their best light still fails to suggest to one of ordinary skill a layer or composition with the instantly claimed features. Accordingly, the rejections under **35 USC 103** are also overcome and withdrawal of same also urged.

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Applicants have carefully considered the inherency comments by the Examiner as raised for the first time in this Office Action. Applicants most respectfully submit that inherency is not an issue with the presently claimed invention in which the now cited features are defined in comparison to those expressed in the cited documents, with the exception of the *volume* percentages of Applicants' particles (compared to Mao's *weight* percentages). Applicants do not consider these two to be equal and thus inherency is not a factor.

The Application is deemed in condition for allowance and such action on part of the Examiner is respectfully requested. Should the Examiner believe, however, that differences remain which, if overcome, would result in allowance of the Application and that said differences can be discussed in a phone conversation, the Examiner is respectfully requested to phone the undersigned, at the number below, for the purpose of discussing said differences and, hopefully, securing an allowance for this Application.

Respectfully submitted,



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